

# DISPLAY DEVICE HAVING A CASING CONTAINING A DISPLAY PANEL, AND PORTABLE APPARATUS HAVING THE DISPLAY DEVICE

## BACKGROUND OF THE INVENTION

The present invention relates to a display device having a box-shaped casing and a display unit contained in the box-shaped casing, and a portable apparatus such as a portable computer having the display device, and more particularly to a structure for fixing the display unit to the casing.

A portable apparatus represented by a portable computer comprises a main body having a keyboard, and a liquid crystal display (LCD) device supported on the main body. The LCD device has a box-shaped flat casing containing a display unit.

The casing has a display cover and a display mask coupled to the display cover. A display opening is formed in the front surface of the display mask. The display unit has a frame of a synthetic resin and a liquid crystal (LC) panel supported on the frame. The LC panel has a rectangular display screen for displaying characters and images. The display screen of the LC panel is exposed to the outside of the casing through the display opening.

In a conventional LCD device, the display unit is supported on the display cover of the casing. The display cover comprises a rectangular bottom wall and four peripheral walls continuous with an outer peripheral portion of the bottom wall. The display unit is contained inside the four peripheral walls. A plurality of columnar boss portions are formed on the inner surface of the bottom wall. The boss portions are located at positions corresponding to the four corner portions of the display unit. The display unit has a plurality of flange-like support portions, and these support portions protrude to the lateral sides of the frame at the four corners of the frame. The support portions are screwed down on the upper surfaces of the boss portions and thereby the display unit is fixed on the display cover.

Recently developed portable computers have been applied to multimedia more and more, and various multimedia information such as characters, sounds and images has been easily processed. Under the circumstances, the LCD device is required to have a larger display screen with enhanced resolution.

In the conventional LCD device, the display unit is fixed to the casing by screwing the flange-like support portions down on the boss portions provided on the bottom wall of the display cover. With this structure, however, the fixing portions for fixation between the boss portions and support portions are located between the display unit and the peripheral walls of the display cover. Thus, the space for containing the support portions and boss portions needs to be provided between the display unit and the peripheral walls of the display cover. As a result, the inside of the casing has a dead space extending in the width direction of the display unit.

Since the width dimension of the casing is predetermined, the size of the display unit is limited by the degree corresponding to the dead space. In the conventional LCD device, the space within the casing for mounting the display unit is thus limited, and the size of the display screen cannot be increased any more.

## BRIEF SUMMARY OF THE INVENTION

The present invention has been made in consideration of the above circumstances, and its object is to provide a

display device capable of containing a display unit with a greater size without increasing the size of a casing of the display device, with screws for fixing the display unit being dispensed with, resulting in a decrease in the number of parts, and to provide a portable apparatus having the display device.

In order to achieve the above object, the present invention provides a display device comprising:

a box-shaped casing having an opening for display; and a display unit contained in the casing, the display unit having a display screen exposed to the opening,

wherein the casing includes a display cover and a display mask coupled to the display cover and provided with the opening, the display cover and the display mask having outer peripheral edge portions, respectively, which are detachably coupled to each other, and

the display unit is provided with a plurality of support portions extending toward the outer peripheral edge portions, the support portions being clamped between the outer peripheral edge portion of the display cover and the outer peripheral edge portion of the display mask, whereby the display unit is fixed in the casing.

According to this structure, there is no need to dispose boss portions for receiving the support portions in the vicinity of the display unit, or to provide a space for fixing the display unit in the casing. Thus, the display unit can be enlarged up to positions adjacent to the outer peripheral edge portions of the display cover and display mask, and the display screen can be enlarged, as compared to the prior art.

Furthermore, there is no need to provide boss portions for receiving the support portions, or screws for fixing the support portions. Accordingly, the number of parts can be reduced and the structure of the casing simplified.

In order to achieve the above object, this invention also provides a display device comprising:

a box-shaped casing having an opening for display; and a display unit contained in the casing, the display unit having a display screen exposed to the opening, and a plurality of support portions projecting outward from an outer peripheral portion of the display screen,

wherein the casing includes a display cover and a display mask coupled to the display cover and provided with the opening, the display cover and the display mask having outer peripheral edge portions, respectively, which are detachably coupled to each other, and

the outer peripheral edge portion of the display cover has a plurality of seat portions on which the support portions are abutted, and the outer peripheral edge portion of the display mask has a plurality of pushing portions cooperating with the seat portions in clamping and holding the support portions.

According to this structure, the support portions of the display unit can be firmly clamped between the seat portions of the display cover and the pushing portions of the display mask. Thus, the display unit can be firmly fixed within the casing.

In addition, there is no need to dispose boss portions for receiving the support portions in the vicinity of the display unit, or to provide a space for fixing the display unit in the casing. Thus, the display unit can be enlarged up to positions adjacent to the outer peripheral edge portions of the display cover and display mask, and the display screen can be enlarged, as compared to the prior art.

Furthermore, there is no need to provide boss portions for receiving the support portions, or screws for fixing the support portions. Accordingly, the number of parts can be reduced and the structure of the casing simplified.